

WETLAND DELINEATION REPORT

SR 18 180th Avenue to Maple Valley (MP 12.57 to MP 16.55) Wetland KA Mitigation Site

King County, Washington

USACE permit number 1999-4-00171

ECY permit number WQC1999-4-00171

Prepared by:

WSDOT Environmental Services Office

Olympia, Washington


March 2010



**Washington State
Department of Transportation**

Introduction

This report was prepared by the Washington State Department of Transportation (WSDOT) to document the wetland boundary delineation for the SR 18 Wetland KA mitigation site. Field work was conducted by Tatiana Craig and Tony Bush, WSDOT biologists, on October 8, 2009. The delineation identifies 0.19 acre of wetland within the boundaries of the mitigation site.

General Information for the SR 18 Wetland KA Mitigation Site		
Location:	T22N, R6E, S30. King County. (Vicinity map, Figure 1)	
	USACE NWP Number	1999-4-00171
	Ecology Permit	WQC1999-4-00171
	Long./Lat. ID Number	1220977473697
	Land Resource Region (LRR)	A
	Major Land Resource Area (MLRA)	A2
	Construction Date	2003
	Monitoring Period	2004-2013
	Year of Monitoring	7 of 10
Area of Project Impact	0.14 acres	
Type of Mitigation	Intended Area (acres)	
Restoration	0.18 acres	
Total Intended Mitigation Area	0.18 acres	
Total Delineated Wetland Area	0.19 acres	

Location

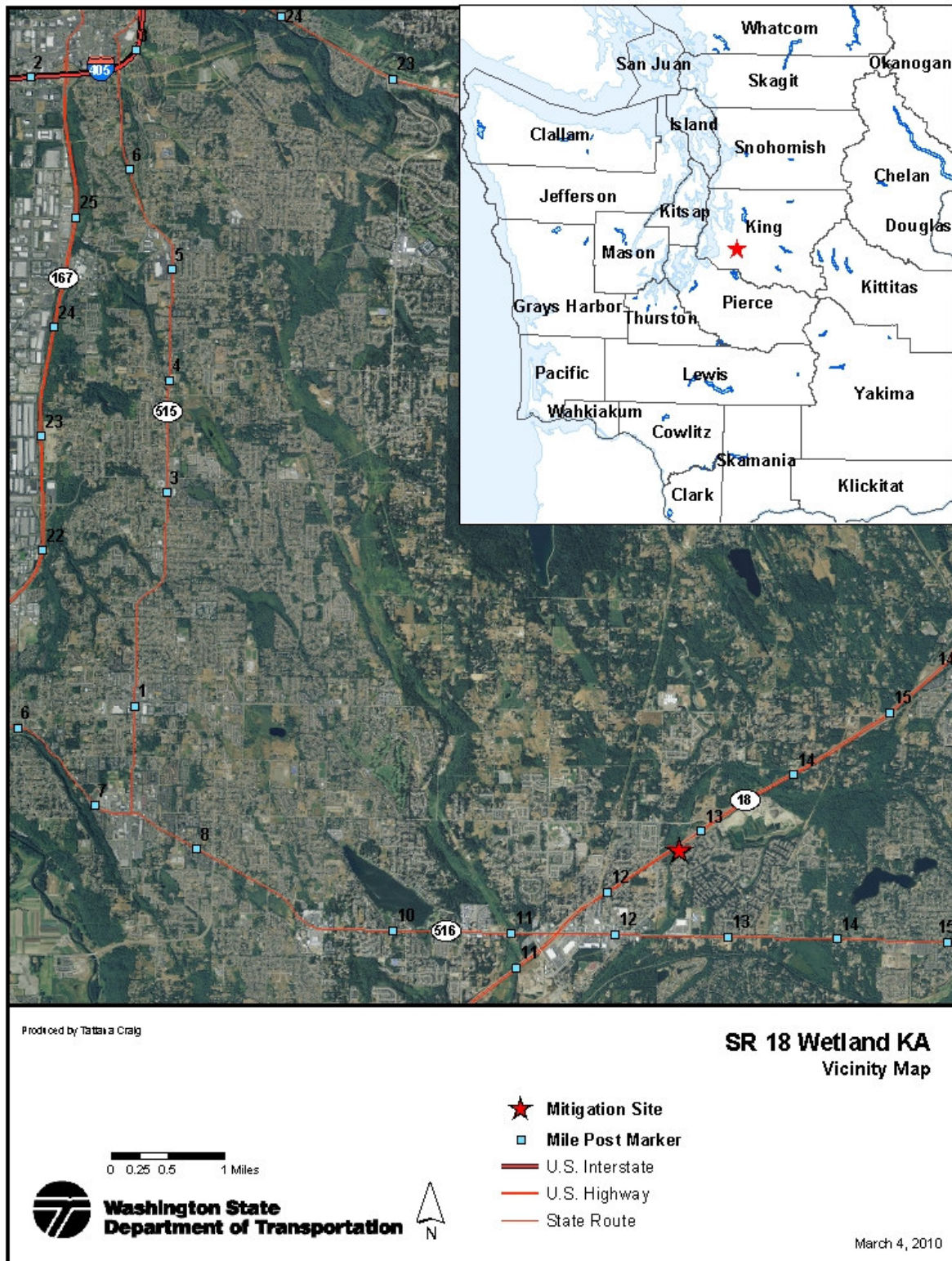


Figure 1. Vicinity Map

Methods

Wetland boundaries within the SR 18 Wetland KA Mitigation Site were delineated using the routine methods described in the:

- Washington State Wetlands Identification and Delineation Manual (Ecology 1997),
- Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987), and
- Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains Valleys and Coast Region (USACE 2008).

Wetland boundaries were delineated based on on-site observations of hydrology, soils and plant communities, in conjunction with background information and data from hydrology monitoring events. Where there are differences in the technical criteria and indicators between the state and Corps manual, we used the indicators in the 2008 Corps supplement.

A Global Positioning System (GPS) GeoXH unit was used to record the wetland boundaries and sampling point locations shown in Figure 2. Wetland boundary points were recorded at regular intervals and at any change in direction along the boundary.

Wetland Delineation and Study Area

Study Area

Wetlands described in this report were assessed only in the study area shown in Figure 2.

Wetlands

Delineation data were collected at two sampling points and recorded on wetland determination data forms (Appendix A). Paired wetland and upland sample points were used to define the wetland edge. The delineation determined that 0.19 acre of wetland is present within the study area at the SR 18 Wetland KA mitigation site.

Precipitation

Precipitation in the vicinity of the SR 18 Wetland KA Mitigation Site is approximately 37.07 inches per year (NRCS 2002). The water year in Washington extends from October 1 through the following September 30. Precipitation for the relevant water year, October 2008 through September 2009, was 33.98 inches. Precipitation was below the 30-year average and within the normal range (33.52 to 40.09 inches) (Appendix C). Based on this information, normal precipitation conditions were present prior to field work.

Growing Season

The following evidence of the growing season was observed at the time of the delineation:

- Vegetative portions present on various herbaceous plant species in the wetland.
- Leaves on woody species were fully emerged.


Appendix B includes a list of plant species observed during the delineation.

GPS Data - SR 18 Wetland KA, 10/8/2009



Figure 2. Study area shown in blue, wetland boundary shown in red, sampling point locations shown in black.

SR 18 WETLAND KA MITIGATION SITE - WETLAND DELINEATION SUMMARY

Total Delineated Wetland Area		0.19 acres	
	Wetland Determination Data Form	Appendix A; Sampling Point W1-SP1	
	Upland Determination Data Form	Appendix A; Sampling Point W1-SP2	
	Delineators	Tatiana Craig, Tony Bush	
	Delineation Date	October 8, 2009	
	Growing Season Observations	Leaves on herbaceous plants and deciduous woody species were fully emerged.	
Vegetation	<p>Trees – Oregon ash (<i>Fraxinus latifolia</i>) Shrubs – Pacific willow (<i>Salix lucida</i> ssp. <i>lasiandra</i>), hardhack (<i>Spiraea douglasii</i>), Sitka spruce (<i>Picea sitchensis</i>) Herbs – broadleaf cattail (<i>Typha latifolia</i>), slough sedge (<i>Carex obnupta</i>), creeping buttercup (<i>Ranunculus repens</i>), reed canarygrass (<i>Phalaris arundinacea</i>)</p>		
Soils	<p>Soils are naturally problematic because they meet the definition of a hydric soil because they are ponded or inundated for very long periods, yet they do not meet any indicators for hydric soils. Therefore soils meet criteria for problematic hydric soils because they do not meet any indicators for hydric soils, though they are hydric, and hydrophytic vegetation and wetland hydrology are present. The “other” indicator is met.</p> <p>Rationale: Generally redoximorphic features form at the wetland edge where the wet/dry cycles occur. The topography surrounding this wetland is steep slopes made up of fill material for SR 18 on one side and the noise wall on the other. These steep slopes abruptly end at the flat-bottomed wetland, with the wetland edge abruptly meeting these steep upland slopes. Since this wetland does not have a gradual edge, nearly all of the wetland soils are ponded or saturated for very long periods throughout the year.</p> <p>Soils examined to a depth of 18 inches did not exhibit hydric characteristics. Matrix chromas of 10YR 2/2, with no redox features were observed. Because these soils are saturated or inundated for very long periods, they meet the criteria of a hydric soil. The abrupt wetland edge, created by steep topography, does not allow for redox features to form. Therefore, hydric soil indicators are not met, but this soil is as a hydric soil.</p>		
Hydrology	<p>Soils were saturated to the surface. Standing water in the sampling pit was 15 inches below the surface at the very beginning of the wet season (starting in October). Ponding to 4 inches was observed in some areas of the wetland. Groundwater and overbank flooding from Jenkins Creek appear to be the main sources of hydrology. Precipitation also contributed hydrologic inputs.</p>		
Rationale for Delineation	<p>Positive indicators of all three wetland criteria are present. The boundary was determined by the presence of wetland vegetation and distinct topographic break. Wetland vegetation stopped abruptly and upland areas directly adjacent to the wetland were dominated by upland species. Distinct topographic break present surrounding 95% of the wetland edge. The other 5% of wetland edge is a low spot in the bank between Jenkins Creek and this riverine wetland, as shown in the photo above.</p>		

Limitations

This wetland delineation report documents the investigation, best professional judgment and conclusions of WSDOT based on the site conditions encountered at the time of this study. The wetland delineation was performed in compliance with accepted standards for professional wetland biologists and applicable federal, state, and local ordinances. It is correct and complete to the best of our knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters until it has been reviewed and approved in writing by the appropriate jurisdictional authorities.

References

1. [Ecology] Washington State Department of Ecology. 1997. Washington State Wetlands Identification and Delineation Manual. Olympia (WA): Washington State Department of Ecology. Publication # 96-94. Available from: www.ecy.wa.gov/pubs/9694.pdf
2. Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Vicksburg (MS): US Army Engineer Waterways Experiment Station. Technical Report Y-87-1. Available from: <http://el.erc.usace.army.mil/wetlands/pdfs/wlman87.pdf>
3. [NOAA] National Oceanic and Atmospheric Administration (US) [Internet]. 2009. National Weather Service Forecast Office (US). Available from: <http://www.weather.gov/climate/index.php?wfo=sew>
4. [NRCS] Natural Resource Conservation Service. 2002. Climate Information – Wetlands Retrieval for Washington. US Department of Agriculture. Available from: <http://www.wcc.nrcs.usda.gov/cgibin/getwetco.pl?state=wa>
5. [NRCS] Natural Resource Conservation Service. 2008. Web Soil Survey for X County, Washington. US Department of Agriculture. Available from: <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>
6. Reed PB Jr. 1988. National list of plant species that occur in wetlands: Northwest (Region 9). Washington (DC): US Department of Interior, Fish and Wildlife Service. Biological Report 88(26.9). Available from: <http://www.fws.gov/nwi/Plants/list88.html>
7. Reed PB Jr. 1993. 1993 supplement to list of plant species that occur in wetlands: Northwest (Region 9). Washington (DC): US Department of Interior, Fish and Wildlife Service. <http://www.fws.gov/nwi/Plants/list88.html>
8. [USACE] US Army Corps of Engineers. 2008. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, ed. Wakeley JS, Lichvar RW, Noble CV. Vicksburg (MS): US Army Engineer Research and Development Center. ERDC/EL TR-08-13. Available at: http://www.usace.army.mil/cw/cecwo/reg/west_mt_intersupp.pdf
9. [WSDOT] Washington State Department of Transportation. 2008a. Wetland Guidelines. Olympia (WA): Environmental Affairs Office. Available from: www.wsdot.wa.gov/Environment/Biology/Wetlands/guidelines.htm.
10. Weather Underground [Internet]. 2009. Weather history data – Washington State weather stations. Available from: <http://www.wunderground.com/history/airport/KRNT/2009/5/16/DailyHistory.html>

Appendix A —Wetland Determination Data Forms

Wetland Delineation Data Forms for:

W1-SP1

W1-SP2

Wetland polygons and sampling point locations shown in Figure 2.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: SR 18 Wetland KA City/County: Covington/King Sampling Date: 10/8/2009
 Applicant/Owner: Washington State Department of Transportation State: WA Sampling Point: W1-SP1
 Investigator(s): Tatiana Craig, Tony Bush Section, Township, Range: 30, 22N, 6E
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 5
 Subregion (LRR): A Lat: 47.37 Long: -122.098 Datum: NAD HARN 1983
 Soil Map Unit Name: Norma sandy loam NWI classification: PSS
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , Or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , Or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

Remarks: Soils are naturally problematic. They meet the definition of a hydric soil because they are ponded or saturated for very long periods of time, however they do not meet a hydric soil indicator. Indicators may not be present because a sharp topographic break between the upland and the wetland does not allow for a gradual sloping area for wet/dry cycles to occur. These areas are where redoximorphic features usually form. See additional notes in the hydric soils remarks. Both hydrophytic vegetation and wetland hydrology are present. This area meets the criteria for a wetland under the guidance provided in Chapter 5 Difficult Wetland Situations in the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (USACE 2008).

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 20'x15')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. <u><i>Populus balsamifera ssp. trichocarpa</i></u>	<u>5</u>	<u>yes</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = <u>2.5</u> , 20% = <u>1</u>	<u>5</u>	= Total Cover																		
Sapling/Shrub Stratum (Plot Size: 15'x15')																				
1. <u><i>Salix lucida ssp. lasiandra</i></u>	<u>20</u>	<u>yes</u>	<u>FACW</u>	Prevalence Index worksheet: <table style="width: 100%; border: none;"> <tr> <td style="text-align: right;">Total % Cover of:</td> <td style="text-align: right;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
Total % Cover of:	Multiply by:																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
2. <u><i>Spirea douglasii</i></u>	<u>10</u>	<u>yes</u>	<u>FACW</u>																	
3. <u><i>Alnus rubra</i></u>	<u>5</u>	<u>no</u>	<u>FAC</u>																	
4. <u><i>Fraxinus latifolia</i></u>	<u>2</u>	<u>no</u>	<u>FACW</u>																	
5. <u><i>Picea sitchensis</i></u>	<u>1</u>	<u>no</u>	<u>FAC</u>																	
50% = <u>19</u> , 20% = <u>7.6</u>	<u>38</u>	= Total Cover																		
Herb Stratum (Plot Size: 5')																				
1. <u><i>Typha latifolia</i></u>	<u>20</u>	<u>yes</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u><i>Phalaris arundinacea</i></u>	<u>15</u>	<u>yes</u>	<u>FACW</u>																	
3. <u><i>Carex obnupta</i></u>	<u>5</u>	<u>no</u>	<u>OBL</u>																	
4. <u><i>Ranunculus repens</i></u>	<u>2</u>	<u>no</u>	<u>FACW</u>																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = <u>21</u> , 20% = <u>8.4</u>	<u>42</u>	= Total Cover																		
Woody Vine Stratum (Plot Size: _____)																				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																
2. _____	_____	_____	_____																	
50% = _____, 20% = _____	_____	= Total Cover																		
% Bare Ground in Herb Stratum <u>58</u>																				

Remarks:

SOIL

Sampling Point: W1-SP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type ¹	Loc ²		
<u>0-18+</u>	<u>10YR 2/2</u>	_____	_____	_____	_____	_____	<u>loamy</u>	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input checked="" type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):	Hydric Soils Present?
Type: _____	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Depth (Inches): _____	

Remarks: These soils meet the definition of a hydric soil because they are ponded or saturated for very long periods. Soils in the wetland are either inundated or saturated year round in normal years. The majority of the wetland is relatively flat-bottomed with the wetland boundary occurring at a steep topographic break at about 12 inches above the line of permanent saturation at the soil surface. Because the topography changes so abruptly, a gradual slope on the wetland edge is not present. These gradual slopes are generally where the wet/dry cycles occur, where hydric soil indicators are generally observed, and where redoximorphic features usually form. Due this abrupt topographic break, typical hydric soil indicators are not present, however, the soils are functioning as hydric soils. Wetland vegetation and hydrology is also present.

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	(except MLRA 1, 2, 4A, and 4B)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Salt Crust (B11)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Stunted or Stresses Plants (D1) (LRR A)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Frost-Heave Hummocks (D7)

Field Observations:	Wetland Hydrology Present?
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>15</u>	
Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>0</u>	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: This location logically meets the Dry-Season Water Table (C2) because the field visit occurs at the very end of the dry season. Though technically, according to the WebWIMP, this field visit occurred at the very beginning of the wet season (October 1 for this location). The dry season for this location officially ends at the end of September (prior to the field visit). The field visit occurred at the very beginning of the wet season when the ground water had not yet experienced a recharge of hydrologic inputs, therefore, this sampling pit meets the indicator for Dry-Season Water Table as well as Saturation. The presence of wetland hydrology also provides supporting rationale to the hydric soil remarks listed above.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: SR 18 Wetland KA City/County: Covington/King Sampling Date: 10/8/2009
 Applicant/Owner: Washington State Department of Transportation State: WA Sampling Point: W1-SP2
 Investigator(s): Tatiana Craig, Tony Bush Section, Township, Range: 30, 22N, 6E
 Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): concave Slope (%): 30
 Subregion (LRR): A Lat: 47.37 Long: -122.098 Datum: NAD HARN 1983
 Soil Map Unit Name: Norma sandy loam NWI classification: UPL
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , Or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , Or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Remarks:					

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 20'x10')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:		
1. <u><i>Alnus rubra</i></u>	<u>10</u>	<u>yes</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC:	<u>2</u> (A)	
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata:	<u>2</u> (B)	
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100</u> (A/B)	
4. _____	_____	_____	_____			
50% = <u>5</u> , 20% = <u>2</u>	<u>10</u>	= Total Cover				
Sapling/Shrub Stratum (Plot Size: 15'x10')	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:		
1. _____	_____	_____	_____	Total % Cover of:	Multiply by:	
2. _____	_____	_____	_____	OBL species _____	x1 = _____	
3. _____	_____	_____	_____	FACW species _____	x2 = _____	
4. _____	_____	_____	_____	FAC species _____	x3 = _____	
5. _____	_____	_____	_____	FACU species _____	x4 = _____	
50% = _____, 20% = _____	_____	= Total Cover		UPL species _____	x5 = _____	
Herb Stratum (Plot Size: 5')	Absolute % Cover	Dominant Species?	Indicator Status	Column Totals: _____ (A)	_____ (B)	
1. <u><i>Agrostis capillaris</i></u>	<u>80</u>	<u>yes</u>	<u>FAC</u>	Prevalence Index = B/A = _____		
2. <u><i>Taraxacum officinale</i></u>	<u>5</u>	<u>no</u>	<u>FACU</u>			
3. <u><i>Leucanthemum vulgare</i></u>	<u>1</u>	<u>no</u>	<u>NL (UPL)</u>			
4. _____	_____	_____	_____			
5. _____	_____	_____	_____			
6. _____	_____	_____	_____			
7. _____	_____	_____	_____			
8. _____	_____	_____	_____			
9. _____	_____	_____	_____			
10. _____	_____	_____	_____			
11. _____	_____	_____	_____			
50% = <u>43</u> , 20% = <u>17.2</u>	<u>86</u>	= Total Cover				
Woody Vine Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:		
1. _____	_____	_____	_____			<input checked="" type="checkbox"/> Dominance Test is >50%
2. _____	_____	_____	_____			<input type="checkbox"/> Prevalence Index is ≤3.0 ¹
50% = _____, 20% = _____	_____	= Total Cover		<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)		
% Bare Ground in Herb Stratum <u>14</u>				<input type="checkbox"/> Wetland Non-Vascular Plants ¹		
Remarks:				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type ¹	Loc ²		
0" +	_____	_____	_____	_____	_____	_____	_____	<u>rip rap</u>
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
¹ Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix								
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)						Indicators for Problematic Hydric Soils³:		
<input type="checkbox"/> Histosol (A1)			<input type="checkbox"/> Sandy Redox (S5)			<input type="checkbox"/> 2 cm Muck (A10)		
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Stripped Matrix (S6)			<input type="checkbox"/> Red Parent Material (TF2)		
<input type="checkbox"/> Black Histic (A3)			<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Loamy Gleyed Matrix (F2)			³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.		
<input type="checkbox"/> Depleted Below Dark Surface (A11)			<input type="checkbox"/> Depleted Matrix (F3)					
<input type="checkbox"/> Thick Dark Surface (A12)			<input type="checkbox"/> Redox Dark Surface (F6)					
<input type="checkbox"/> Sandy Mucky Mineral (S1)			<input type="checkbox"/> Depleted Dark Surface (F7)					
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			<input type="checkbox"/> Redox Depressions (F8)					
Restrictive Layer (if present):					Hydric Soils Present?			
Type: _____					Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Depth (Inches): _____								
Remarks: This sampling point is on a rip rap slope adjacent to a noise wall. Soil is not present. Substrate in this area consists of a mat of living roots and organic matter from an herbaceous plant community with rip rap below.								

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	(except MLRA 1, 2, 4A, and 4B)	(MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Stunted or Stresses Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			
Field Observations:		Wetland Hydrology Present?	
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Depth (inches): _____			
Depth (inches): _____			
Depth (inches): _____			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

Appendix B — Field Observations

Observed Plant Species on the Mitigation Site

Scientific Name	Common Name	Wetland Indicator Status*
<i>Agrostis capillaris</i>	colonial bentgrass	FAC
<i>Alnus rubra</i>	red alder	FAC
<i>Carex obnupta</i>	slough sedge	OBL
<i>Fraxinus latifolia</i>	Oregon ash	FACW
<i>Leucanthemum vulgare</i>	oxeye daisy	NL
<i>Phalaris arundinacea</i>	reed canarygrass	FACW
<i>Picea sitchensis</i>	Sitka spruce	FAC
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>	black cottonwood	FAC
<i>Pseudotsuga menziesii</i>	Douglas-fir	FACU
<i>Ranunculus repens</i>	creeping buttercup	FACW
<i>Spiraea douglasii</i>	hardhack	FACW
<i>Salix lucida</i> ssp. <i>lasiandra</i>	Pacific willow	FACW+
<i>Taraxacum officinale</i>	common dandelion	FACU
<i>Thuja plicata</i>	western red cedar	FAC
<i>Typha latifolia</i>	broadleaf cattail	OBL

* Reed 1988, 1993:

OBL = occurs in wetlands > 99% of time
 FACW = occurs in wetlands 67-99% of time
 FAC = occurs in wetlands 34-66% of time
 FACU = occurs in wetlands 1-33% of time

UPL = occurs in uplands > 99% of time
 NI = indicator status not known in this region
 NL = not on list of indicator plants
 ~ = unsure as to FAC or FACU

Appendix C — Precipitation Data

Appendix C-1. Comparison of Observed and Normal Precipitation Monthly precipitation data for Seattle Tacoma, Washington (NOAA 2009).

Month	Precipitation (inches)				
	Recorded Totals ^a		1971-2000 ^b		
	2008	2009	30% chance will have		Average
			Less than	More than	
January		5.40	3.58	6.10	5.13
February		1.51	2.73	5.02	4.18
March	-	4.16	2.77	4.40	3.75
April	-	3.36	1.71	3.11	2.59
May	-	3.61	1.16	2.13	1.77
June	-	0.18	0.96	1.79	1.49
July	-	0.06	0.43	0.97	0.79
August	-	1.16	0.38	1.24	1.02
September	-	1.75	0.62	2.03	1.63
October	2.17	-	1.96	3.86	3.19
November	6.52	-	4.10	7.02	5.90
December	4.10	-	3.94	6.68	5.62
Annual			33.52	40.09	37.07
Relevant Water Year (Oct 1–September 30, 2009)	33.98				

^a NOAA 2009

^b NRCS 2002

**Appendix C-2. Daily Precipitation 10 days preceding field work,
Seattle-Tacoma, Washington (Weather Underground 2009)**

Date (2009)	Daily Precipitation (inches)^a
October 7	0.00
October 6	0.00
October 5	0.00
October 4	0.00
October 3	0.00
October 2	0.44
October 1	0.06
September 30	0.00
September 29	0.29
September 28	0.01

^a Weather Underground 2009